

PATENT APPLICATION FOR
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TITLE OF INVENTION

Paintball gun barrel modification and associated mechanism to allow for removal of ruptured paint ball material during game or other battle type operation.

FIELD OF INVENTION

This invention is used on a gas powered paintball gun. When the barrel is modified, with or without the optional cover, it can increase the amount of successful markings during battle situations (such as game or tournament play, military training operations, or law enforcement activities). It does so by allowing the paintball skin and contents to accumulate in the cleanout openings and be purged at a time of the shooter's convenience.

The sport and games of paintball are played using pneumatic powered paintball guns that shoot biodegradable gelatin capsules called paintballs. These paintballs are specifically designed to break on impact and will thus leave a mark of washable water-soluble paint on its target. Paintball as a recreational sport can be played all year round and in as much have become increasingly popular nation wide. Individuals or teams play these games. Paintball in its most common form is played as a team sport where two opposing teams compete to "capture the flag." This game is won when a member of one team captures the opposing team's flag without having been marked.

Paintball as an industry is marketed globally by Internet websites, which provide news, tournament listings, on-line games, and much more. Local gun shops, sporting good and

dedicated paintball stores also provide information, sell equipment, host games, sponsor teams for tournament play, and generally support paintball as an industry. In all the excitement, paintball has become big business.

With this growth, paintball has become highly competitive. The end goal of each player is to make as many markings as possible, and to those ends a device that will ensure a barrel to be free from debris, and ready for firing, will provide a competitive advantage.

Paintball is also used by law enforcement and the military for battle like situations that also require the clearing of a paintball gun barrel during use. Though the ball contents are often not as paint like; the cleaning requirements are often the identical. Paintball contents in these applications can include (but are not limited to) pepper spray, marking inks and the like.

DISCUSSION OF PRIOR ART

Guns and removable barrels and barrel assemblies have been around for a substantial period of time. Paintball guns also have been available for decades. The paintballs, which are sensitive to contact due to their skin material being made of gelatin, plastic, or other extremely thin materials, are in common use today. The contents of the paintballs can differ based on application, which can be military, law enforcement, or games. However, these are not the subjects of this invention.

The prior art does not, at all, address the problems associated with the occurrence of rupture during the firing of paintballs.

BRIEF SUMMARY OF INVENTION

The subject of this invention is an improvement to paintball gun barrel assembly. The object of which is to increase the meantime between failure while reducing the time to effect repair by clearing the contents and debris without the need for barrel removal.

Paintballs are expected to rupture on impact, yet are not expected to rupture when accelerated to a velocity of 300 feet per second. Given the skin material used and the manufacturing processes it comes as no surprise that this is not always the case. Further, the extended length of the barrel cause such a rupture to remain in the barrel and interfere with,

and often cause additional ruptures of the consecutive firings. The result is that the user may need to affect a repair during battle.

The invention provides a user mechanism hereafter called “cleanout openings” (or “cleanout openings and cover”); which allows a ruptured paintball to accumulate and be later discharged. This cleanout will reduce the time to effect repair on the occurrence of a paintball rupture without the need for removal of the barrel. It also reduces the need for “user awareness” of the ruptures because of its gathering capabilities. The end result is compound failures will not occur due to the premature rupturing of a single paintball, which is a substantial advantage given the rapid rate of fire during field-of-battle like conditions.

BRIEF DESCRIPTION OF THE DRAWINGS

The object and improvement of this invention is best understood from the wording of the detailed description when taken in context with the drawings supplied here within. These drawings are detailed to be informative and may not reflect the actual item, scale, or proportions. They are not intended to be the complete representation of the invention, and should not be interpreted in a way that limits the scope of the invention otherwise detailed in other parts of this document.

Page 1. The preferred Embodiment of the Cleanout design

Figure 1A gives us an artist’s rendering of the appearance of a barrel that has been modified as described here within. The figure shows the cleanout cover 12 in a slightly open position exposing the cleanout openings 11 (in this case slots). Figure 1B is a close up of Figure 1A which better shows the openings and the cover.

Page 2. The Cleanout openings and optional cover in normal use

Figure 2A and 2B outlines the appearance of a two-piece barrel assembly as it is attached to the marker gun itself. Figure 2A shows the optional clean out mechanism 12 (in this case a sliding cover) in the normal firing position. Figure 2B in the alternative shows the clean out cover in the cleaning position 15.

Page 3. Cleanout Openings

Figure 3A, 3B and 3C show potential cleanout openings configurations. It should be noted that virtually any shape can be used but the sizing must be large enough to accommodate the passage of the paintball skin. Figure 3A shows a single line of holes spaced on 90 degree about the center of the barrel. Figure 3B shows multiple holes in a pattern of 45 degree about the center of the barrel. Figure 3C shows the openings as slots. This is but a small set of the almost infinite possibilities.

Page 4. Cleanout Optional Mechanisms

Figure 4A, 4B and 4C show several configurations of cleanout openings with covers. The mechanisms shown are covers that rotate, pivot, or slide out of position to effect cleanout of the barrel. Figure 4A shows a pivoting cover that moves to allow for cleanout operation (can be one or many holes). Figure 4B shows a holed cover that rotates. Figure 4C shows a cleanout with holes that are sized approximately equal to those otherwise found on the barrel **13**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1A and 1B illustrate a standard paintball gun barrel **10** with cleanout opening modifications **11** and a cleanout cover **12** (in this case a slide cover). The gun barrel can be newly manufactured to incorporate these improvements or modifications can be made to existing gun barrels. Figure 2A and 2B shows the invention in its two operating positions; the normal firing and cleanout positions.

Paintballs rupture for a number of causes, the highest percentage of which occur when the paintball reaches maximum velocity. It has been proven by others that the maximum velocity is obtained in the first three to five inches. In this general case the cleanout openings should be placed roughly 1.75" from this point. This distance has been determined to be where the debris and contents will accumulate. As such its location will best aid in the removal of the debris and contents of that ruptured ball. This distance is best shown **14** in Figure 2A which is a two piece barrel assembly with the three to five inch bore diameter limited to the first barrel stage from the breech face.

The preferred embodiment uses slots **11** as the opening form for three reasons. First, slots hold the most material given the barrel circumference. The slots in this embodiment are 1.45" in length and will hold 1.75 cubic inches of material. Second, slots are better suited for the removal of the paintball skin after it ruptures. Lastly, slots provide a wider tolerance of the point of impact of the ruptured ball.

The cover mechanism **12** best when the two diameters (i.e. the barrel outer diameter, and the cover inner diameter) have sufficient room to move, and allow for a sealing device on each end. This will also leave some room for the contents of the paintball to accumulate. In the preferred form the two diameters leave a slight gap of roughly 0.01", and uses o-rings to seal the cover. These o-rings should be sized as to allow the cover to move with a very slight resistant. The open position of the cover **15** should allow the slots to be completely exposed.